Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

Satellite-derived bathymetry for nearshore benthic habitats in Timor-Leste

1.2. Summary description of the data:

Bathymetric data derived from multispectral, high-resolution (2 m) satellite imagery from DigitalGlobe's WorldView-2 satellite to provide near complete coverage of nearshore terrain along the northern coastline of Timor-Leste, including the district of Oecusse to the west of mainland Timor-Leste and Atauro Island. Satellite images acquired by the NOAA Coral Reef Ecosystem Program (CREP) for the region are from Feb 9, 2010 to October 2, 2013. Methods used by CREP to estimate depths from the WorldView imagery were adapted from instructions developed by Kyle Hogrefe for using IKONOS imagery to derive seafloor elevations in optically clear water (Ehses and Rooney 2015).

Bathymetry values shallower than ~20 m were derived by gauging the relative attenuation of coastal, blue, green and yellow spectral radiance as a function of depth. A multiple linear regression analysis of coastal, blue, green and yellow band spectral values against in-situ depth determined the variables of y-intercept, coastal, blue, green and yellow slope values. The variables for each band were then used in a multivariate slope intercept equation to derive depth over the imagery. Variables and combinations of the bands were adjusted to improve the statistical accuracy and spatial coverage of the final derived bathymetry product. Digital image processing to derive depths was conducted with ENVI, and editing and integration was performed using Esri's ArcGIS.

The method assumes uniform water clarity but deviations from that condition made extraction difficult in water depths greater than 20 m. Results show that biotic material, or sediment in the water column skewed results shallower if the material has a high albedo and deeper if the material has a low albedo.

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:

2010-02-09 to 2013-10-02

1.5. Actual or planned geographic coverage of the data:
W: 124, E: 127.4, N: -8.1, S: -9.4
The northern coastline of mainland Timor-leste, as well as the coastlines of Oecusse district and Atauro Island.

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Map (digital)

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)
Instrument: Not applicable
Platform: Not applicable
Physical Collection / Fishing Gear: Not applicable

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
Annette M DesRochers

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:

2.4. E-mail address:
annette.desrochers@noaa.gov

2.5. Phone number:
(808)725-5461

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:
Tomoko S Acoba

3.2. Title:

Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

Yes

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

Unknown

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Lineage Statement:

Bathymetry data were derived for nearshore waters along the northern coastline of Timor-Leste, and the coastlines of Oecusse district and Atauro Island, from WorldView-2 satellite imagery following methods developed by Ehses and Rooney (2015).

Process Steps:

- Satellite imagery was collected by the WorldView-2 commercial Earth observation satellite owned by DigitalGlobe. WorldView-2 provides panchromatic imagery of .46-meter resolution, and eight-band multispectral imagery with 1.84 meter (6 foot 0 inch) resolution.
- Image pre-processing steps are described in the NOAA Technical Memorandum " Depth Derivation Using Multispectral WorldView-2 Satellite Imagery". Pre-processing of all WorldView-2 satellite images was performed using the same methods, to produce a deglinted image, radiance and depth invariant data layers. (Citation: Ehses , J.S., and J.J. Rooney. 2015. Depth derivation using multispectral WorldView-2 satellite imagery. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-46, 24 p.)
- The available ground-truth data (in-situ single beam depth data) was separated into two subsets; one subset was used to develop the multivariate slope intercept equation, and the second subset was used for the error analyses. The deglinted values of coastal, blue, green, and yellow bands were extracted in ArcGIS using the ground truth data set aside for the equation.
- Multiple linear regression analysis of the extracted deglinted values and ground-truth data were performed in Excel and the multivariate slope intercept equation from the analysis was applied to the deglinted image in ENVI.
- An error analysis was performed comparing the calculated depths with the second subset of the ground truth data. Depending on the results of the error analysis (the

level of agreement between the derived data and the ground truth data), different formulas were tested using different combinations of the color bands to improve the results (i.e., different color bands from the satellite imagery were inserted into differing formulas to calculate the derived bathymetric data).
- The derived bathymetry values that are out of range based on the error analysis were clipped out in ArcGIS.
- A readme text file (README_FILE.txt) was prepared for each image used that catalogs the specific details for each set of derived depths, including the source image, processor names, dates, ground-truth data details, formulas, slope values, coefficients, and process steps.
- The complete methodology followed to derive depths is described in the final report for Timor-Leste prepared by the NOAA Coral Reef Ecosystem Program. (Citation: PIFSC. 2017. Interdisciplinary baseline ecosystem assessment surveys to inform ecosystem-based management planning in Timor-Leste: Final Report. NOAA Pacific Islands Fisheries Science Center, PIFSC Special Publication, SP-17-02, 234p.)

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):
Based on the error analyses, derived bathymetry was clipped where statistical results were poor.

6. Data Documentation
The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?
Yes

6.1.1. If metadata are non-existent or non-compliant, please explain:

6.2. Name of organization or facility providing metadata hosting:
NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:
https://www.fisheries.noaa.gov/inport/item/46150

6.4. Process for producing and maintaining metadata
(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

Yes

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:

National Centers For Environmental Information (Boulder) (NCEI-Boulder)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:

http://accession.nodc.noaa.gov/0169504
http://accession.nodc.noaa.gov/0169504
https://www.pifsc.noaa.gov/library/pubs/tech/NOAA_Tech_Memo_PIFSC_46.pdf

7.3. Data access methods or services offered:

Data can be accessed online via the NOAA National Centers for Environmental Information (NCEI) Ocean Archive

7.4. Approximate delay between data collection and dissemination:

Unknown

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to

identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:
(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)
NCEI-CO

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):
Pacific Islands Fisheries Science Center - Honolulu, HI

8.3. Approximate delay between data collection and submission to an archive facility:
Unknown

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?
Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection
NOAA IRC and NOAA Fisheries ITS resources and assets.

9. Additional Line Office or Staff Office Questions
Line and Staff Offices may extend this template by inserting additional questions in this section.